Special Article

European Community Delegation, Washington, DC

Market Stability & World Food Security

This article presents excerpts from a session at USDA's 1997 Agricultural Outlook Forum held in Washington, D.C. on February 24-25. The authors represent the World Bank, USDA, the Organization for Economic Cooperation and Development (OECD), and the International Food Policy Research Institute (IFPRI). They offer comments on several aspects of food market stability and world food security:

- *an overview of the past, present, and future of world food needs, with suggestions for continued progress;*
- *the USDA perspective, with a review of recommendations agreed to at the recent World Food Summit;*
- *the changing market picture faced by importing countries and the mutual obligations of food importers and exporters in a freer global trading system; and*
- *the case for increased support of research, particularly agricultural biotechnology, to meet the future food security needs of developing countries.*

This article represents a diversity of viewpoints and includes non-USDA as well as USDA authors. The contributions of non-USDA authors broaden the debate and provide additional perspective, but their statements do not necessarily reflect the views or projections of the Department of Agriculture.

Food Needs For The 21st Century

Ensuring food security for all is a challenge with many dimensions. Issues of food security exist at the household, national, and international levels, and the focus of policy intervention clearly changes as the time frame lengthens.

In the short term, reducing hunger clearly must focus at the household level; globally there is little to do except provide emergency food aid if it is available. In the long term, however, productivity enhancement, adequate global supplies, and a well-functioning trading system are critical.

Performance to Date (1960-96)

The world did remarkably well in expanding food production over the 30-year period 1960-90, despite periodic predictions of imminent shortages (1965-66, 1972-74, 1988). World cereal production more than doubled, per capita food production increased 37 percent, calories supplied increased 35 percent, and real food prices fell by almost 50 percent.

Regionally, average calories available per day increased significantly in the Near East and North Africa, East Asia, and Latin America, to levels of 2,700 calories per day or higher. South Asia grew more slowly, however, and still is a region with significant undernutrition, while Sub-Saharan Africa experienced a decline in per capita food availability.

The increases in production came from three sources—biological yield increases, land-use intensification (irrigated acreage in developing countries doubled), and expanded area. Between 1994 and 1996, however, world wheat, corn, and rice prices increased 70-100 percent and the stocks-to-use ratio plummeted to its historical low (13.2 percent). Concerns surfaced about whether this was the beginning of demand finally outrunning supply or simply a short-term deviation.

Those arguing the case for a prolonged period of shortages and rising prices cited declining growth rates on yields in the 1990's, losses of land from production, and water and environmental constraints as powerful indicators for the future. Others argued the market was simply overreacting to a short U.S. crop in 1995 and to policy changes in the European Union and the U.S. that lowered farm prices and reduced stocks.

A 7.5-percent increase in production globally in 1996 caused wheat and corn prices to drop sharply to pre-1994 levels by early 1997. Thus for the moment, those arguing that 1994-96 was only a spike, not a change in long-term trends, seemed to win the day.

The Future (2010-20)

Three recent simulation studies done at the International Food Policy Research Institute IFPRI), the Food and Agriculture Organization (FAO), and the World Bank have projected global cereal or food balances to 2010 and arrived at similar conclusions. They project grain yields to increase 1.5-1.7 percent per year, area harvested to increase modestly, global grain demand to grow more slowly, and trade in grains to increase. They expect real grain prices to remain constant or decline.

World food supply is expected to meet global demand, although regional food problems are expected to persist in South Asia and especially Sub-Saharan Africa. The studies identify rising yields as key to future food supplies, which will require continued investment in agriculture, including research.

IFPRI's study also made projections to 2020, which show a relatively healthy global food supply-and-demand balance that year. Real grain and meat prices are projected to continue falling (20 percent and 10 percent between 1990 and 2020). Trade is projected to expand substantially, with imports by developing countries doubling. Food problems are projected to persist in Sub-Saharan Africa, where imports are projected to triple, likely beyond the region's capacity to pay for them.

A view that contrasts with these three studies has been presented by the Worldwatch Institute, which argues that there is little backlog of unused agricultural technology, that fish production has reached its biological limits, and that rangeland carrying capacity has been exceeded. Worldwatch further argues that the demand for water is pressing hydrological limits, that fertilizer responsiveness is declining, and that much cropland (especially in China) is being lost to degradation, urbanization, and industrialization. The resulting conclusion is quite pessimistic, with the only possible solution being greatly expanded trade, which the Institute sees as doubtful.

Both sets of views agree, however, that continued investment in agricultural research should be pursued, and that farming systems must increase the efficiency of resource use and must not degrade the environment. IFPRI's study examined an alternative scenario in which investment in agricultural research is lower, and income growth slower. According to these projections, a decline in public investment in agricultural research would have severe consequences for the global food situation, causing real prices to rise and malnutrition to increase.

In the long run, food security can be achieved if we can accomplish four tasks: 1) develop sustainable production systems capable of nearly doubling output; 2) put in place domestic and international policies and institutions that do not favor industrial development over agricultural development and that provide appropriate incentive to farmers around the world; 3) continue to invest in public agricultural research through such organizations as the Consultative Group on International Agricultural Research (CGIAR); and 4) persist in removing distortions to free agricultural trade in all countries.

These are four big "ifs," but they must be met—for without them the long-term prospects are not very pleasant to contemplate.

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World Food Security: A USDA Perspective

The challenges, concerns, and uncertainties of future world food security brought representatives from about 180 nations to the World Food Summit in Rome last November. From the U.S. point of view—a view apparently widely shared—the Summit was a good start.

It focused needed attention on those who suffer chronic hunger and malnutrition around the globe. Nations undertook a renewed commitment to alleviate hunger, setting as a goal the reduction by half of the number of people currently suffering from undernutrition, no later than the year 2015.

Equally important, the Summit Plan of Action helped define the steps needed to improve food security and reduce hunger, taking a comprehensive approach that requires actions by both developing and developed nations, as well as by the international community and multilateral institutions.

Three areas addressed in the Plan of Action deserve particular attention. First, food security can be achieved only through appropriate policies within individual countries. Food-importing developing countries can get help from outside, but their problems cannot be solved from outside. Leaders in these countries need to enact the internal policy reforms necessary to release private-sector initiative and help pull their countries out of poverty and dependence. The countries that have demonstrated the most progress in achieving economic development and food security are those that have seriously pursued market-oriented policy reform.

Second, future food security depends on continued and even stronger emphasis on agricultural research and development at the national, regional, and international levels. And this must include policies that encourage both the transfer of new technologies to developing countries and their subsequent use in those countries.

Third, trade liberalization is one of the most critical, most fundamental, keys to greater world food security. U.S. efforts helped ensure that this view was incorporated as one of the core commitments in the Summit Plan of Action. A fair, open, market-oriented trading system is the best suited to aligning supply with demand, maximizing output over time, and reducing wide swings in production.

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Freer trade provides importing countries with a wider choice of suppliers and allows them to take full advantage of the world market to make up for shortfalls in domestic production. The variability of production is almost always lower at the global level than at the country level.

Of course, freer trade involves obligations. It requires that food exporting nations remain consistent, reliable suppliers. Export embargoes and taxes undermine the foundations of an open market. But importing countries also have an obligation. If farmers in exporting countries are going to rely on market signals to determine what and how much to produce, those signals should not be interrupted or distorted. Exporters need to know the markets will be there—they need reliable buyers and buying patterns they can count on.

Nations need not fear freer trade from a food security standpoint. In a world where trade flows freely across borders, food security is not constrained by the limitations of self-sufficiency. It is not measured by food-aid budgets. It is not a function of how much each nation produces, but rather of global production, freedom of movement in products, and affordability—the ability, year after year, of developing and developed countries alike to buy the food they do not produce.

Coupled with internal policy reforms, development assistance, support for agricultural research, and food aid where needed, freer markets can contribute substantially to a more food-secure community of nations. By embracing these objectives, the World Food Summit Plan of Action provides a solid, well-balanced set of recommendations that can be useful to individual nations and the international community in addressing the problems of hunger and food security. But the Summit was only a start. The full measure of its contribution—its ultimate success—will depend on the political will that countries demonstrate, individually and in concert, in the follow-up this year and over the years to come.

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Curbing Price Swings in Global Food Markets

Importing countries in international markets share similar interests. They want assured access to supplies of grain of acceptable quality at "reasonable" prices. Being economically rational, they wish to obtain grain at the lowest possible cost. For the most part, they do not care whether this results from subsidies by exporters. However, importing countries tend to be particularly concerned about the possibility that prices will be "unreasonably" high, and especially that they may face rapid increases in prices.

The greatest change affecting the potential variability of international prices over the past few years has been the virtual elimination of public stocks of grain in OECD countries. By the end of the 1995/96 season, stocks of wheat in OECD countries had fallen to roughly 19 percent of production, compared with an average of 29 percent during the preceding 5 years.

In an era of budget restraint, governments are increasingly unwilling to fund stockholding and expect this to be undertaken by the private sector. It is difficult to determine the extent to which the reduction in the role of the public sector will be replaced by private stockholding in OECD countries, but some increase in private stocks seems likely. At the same time, stocks in the non-OECD area have largely been maintained, and consequently their share of the world total has increased.

Public stocks of grain, particularly those in major exporting countries such as the U.S., have provided an important buffer against weather-induced fluctuations in production. While the acquisition and release of public stocks in the U.S. can hardly be said to have been driven by the desire to reduce fluctuations in international prices, to a large extent the amount of stocks has varied inversely with international prices on a year-to-year basis.

The stocks-to-use ratio provides an important indicator of when the world is at risk of experiencing rapid increases in grain prices. If stocks are low relative to consumption, there is clearly a greater risk of a runup in prices when production is below average. But it is important to note that the ratio at which price spikes are likely to occur is not fixed, as is sometimes assumed. In fact, this ratio has been declining over time. The three major episodes of sharp upward price movements in wheat since 1975 occurred with substantially different stocks-to-use ratios. For example, in 1979 a runup in world wheat prices took place with a stocks-to-use ratio of 30 percent, whereas a broadly similar price runup in 1995/96 occurred when the ratio was less than 20 percent.

An explanation for this decline in the sensitivity of prices to the level of stocks is not hard to find. The last 20 years have witnessed an enormous increase in efficiency in the functioning of international grain markets. Information on availability and demand has become more accurate, and easier and faster to

obtain. Improvements in infrastructure in many countries mean that available supplies can be moved to market positions more rapidly. The revolution in communications technologies and computing has made a significant contribution to efficiency. Fewer stocks are tied up in government programs. In some cases domestic markets have become more open, allowing more of the adjustment to a short global crop to be reflected in consumption. Thus the world can expect to have less variable grain prices with lower levels of stocks. This is good news, since storage is expensive and few in the private sector are prepared to absorb the costs of holding significant grain stocks from year to year.

Further progress in reducing trade barriers, and the consequent globalization of markets, would help to increase the collective capacity to adjust to shocks. But policy reforms that do not lead to closer integration of domestic and international markets can actually increase the potential variability of international prices. What is required is a reduction in tariffs to levels that result in the effective transmission of changes in international prices to domestic markets. The resulting market integration would contribute much toward greater price stability at a global level. Until such integration occurs, it is inevitable that policies and policy interventions will continue to have a potentially destabilizing effect on international prices.

The second area in which changes could be achieved is through the growth of private-sector mechanisms for managing price variability and risk. In many countries in which domestic grain prices have largely been controlled by the government, agents (producers, intermediaries, and consumers) have limited experience with strategies for dealing with price variability. When the government guarantees prices, farmers or merchants have little need to develop a marketing plan for their grain, to decide when to sell or to store, whether to contract forward, or whether to use futures or options as part of a risk management strategy. When the government steps out of the grain marketing picture, there is a need for agents to develop such skills and to be able to take advantage of the private mechanisms that exist for risk management.

The world as a whole can best cope with unanticipated variability in prices due to the weather by working to ensure the full integration of domestic and international grain markets. This will require further reform of agricultural and trade policies to ensure true globalization and greater sharing of the burden of adjustment. Importing countries can best cope with the effects of such integration by facilitating the development of private mechanisms for risk management.

Price variability is a natural part of market adjustment and a normal feature of efficiently functioning agricultural markets. In the main, government intervention has not been particularly successful in reducing such variability, or if it has, this has come at a considerable cost to the country concerned or to others affected by the results of its actions.

Poor countries that import significant quantities of grain on commercial terms may experience economic and social problems if prices rise too sharply. Their special needs were recognized in the Uruguay Round agreement and reaffirmed at the recent Singapore summit meeting of the World Trade Organization. In the short term, the world community can use targeted assistance to best cope with the implications for poor countries of allowing prices to signal abundance or scarcity. In the longer term, the solution lies in addressing the root cause of food insecurity—poverty.

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Role of Research in the World Food Outlook

Science has made major contributions to food security in recent decades, through enhanced knowledge and improved technologies for food and agriculture. But existing technology and knowledge will not be sufficient for production of the food needed to assure a food-secure world in the years to come.

Research has a key role to play in maintaining and raising yields in the more favorable agricultural areas where significant gains have already been achieved. At the same time, the balance between these areas and less favorable areas—those with limited and unreliable rainfall and fragile soils—must be redressed.

The less favorable areas comprise much of the cultivable area in many developing countries and are home to many of the world's food-insecure and poor people. The more favorable areas will remain important sources of expanded food production in the future and, by minimizing the need to exploit new lands, will help to reduce pressures on the natural resource base. But a continuation of past low priority on the less favorable areas is inappropriate and insufficient to assure sustainable food security.

Agricultural biotechnologies such as genetic engineering are among the most promising developments in modern science for helping to meet world food security needs. Used in collaboration with traditional or conventional breeding methods, they can raise crop yields or productivity, increase resistance to pests and diseases, and enhance the durability of products during harvesting or shipping.

Yet, with the exception of a very limited amount of work by the centers of the Consultative Group on International Agricultural Research (CGIAR), little research in agricultural biotechnology is taking place in or for developing countries. Most biotechnology research is occurring in private firms in industrialized countries, focuses on the plants and animals produced in temperate climates, and aims to meet the needs of farmers and consumers in industrialized countries.

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Low-income developing countries are constrained in their pursuit of agricultural biotechnology research by limited public- and private-sector funding and by shortages of trained personnel. They can address these constraints, however, by providing incentives to the private sector to engage in such research, by collaborating with international research programs, and by seeking private- and public-sector partners in industrialized countries.

Agricultural biotechnology research that is relevant to the needs of farmers in developing countries, and to conditions in those countries, is essential, and the benefits of that research should be transmitted to small-scale farmers and consumers in those countries at affordable prices. Otherwise, developing countries will not only fail to share in the benefits of agricultural biotechnology, but will be seriously hurt as synthetic alternatives to their products are developed in industrialized countries, a situation already happening with cocoa and vanilla.

A more fundamental constraint to the use of agricultural biotechnology in and for developing countries is the attitude toward risk among the nonpoor in both industrialized and developing countries. Considerable resistance to agricultural biotechnology has arisen on the grounds that it poses significant new ecological risks and that it has unacceptable social and economic consequences. Although no ecological calamities have yet occurred, some observers fear that transgenic crops will develop troublesome new weeds or threaten crop genetic diversity.

Of course, any new products that pose such risks should be carefully evaluated before they are released for commercial development. But by raising productivity and food production, agricultural biotechnology will reduce the need to cultivate new lands and could therefore help conserve biodiversity and protect fragile ecosystems. To address concerns about ecological risks, developing countries can adopt regulations that provide a reasonable measure of biosafety without crippling the transfer of new products into the field.

As for the social and economic consequences of biotechnology, there is some concern that large-scale and higher income farmers will be favored because they will have earlier access to and derive greater benefits from agricultural biotechnology. These concerns are remarkably similar to those raised about the Green Revolution. Whatever the shortcomings, real or alleged, of the Green Revolution, it did avert widespread starvation and helped many millions of people escape hunger once and for all. Similarly, agricultural biotechnology can contribute to feeding many more people in a sustainable way.

If we are to produce enough food to meet increasing and changing food needs, to make more efficient use of land already under cultivation, to better manage our natural resources, and to improve the capacity of hungry people to grow or purchase needed food, we must put all of the tools of modern science to work. In a world where the consequence of inaction is death for thousands of children daily and persisting hunger for millions of people, we cannot afford to be philosophical or elitist about any possible solution, including agricultural biotechnology. Modern science by itself will not assure food for all, but without it the goal of food security for all cannot be achieved.

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14	*Cotton & Wool Outlook (4 pm)***
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17	*Tobacco**
21	*Agricultural Outlook**
22	*U.S. Agricultural Trade Update****
23	*Europe Update**
24	*Vegetables & Specialties**
30	*Potato Facts****

*Release of summary, 3 pm.
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